

Madison, January 21, 1952

Dear Cavalli:

I enclose the cultures you requested. Of "58" I am quite uncertain but am sending the enclosed sample in order not to delay your receipt of the other cultures. I shall be checking it meanwhile, and will inform you if it is amiss.

679 (F+) and 679-680 (F-) you are already acquainted with.

W-1802 is a BM- F-. It has a rather complicated history, most of which is irrelevant to the F story. Mrs. Lederberg noticed that a single colony isolate from her lambda-sensitive indicator strain W-518 was infertile; the original W-518 is F+. W-1802, however, is phenotypically and genotypically similar to 58-161 except that it is F- and V_1^r .

~~W-1817~~ W-1817 is W-1177 which has been made F+ by growing it briefly with a standard F+ culture, then reisolated on EMB lactose. This transfer of F+ has been confirmed repeatedly, occurs quite generally, and is entirely independent of lambda (e.g. lambda and F+ were transferred separately from 58-161 to a lambda-sensitive F-; one lambda-sensitive F+ transferred F+ to another lambda-sensitive F-). The mechanism of transmission of F+ is quite mysterious. Filtrates have not worked; it occurs very efficiently in growing mixed cultures. I am now trying to narrow this down somewhat, and am also testing other coli strains as a source of F+. In this connection, I would appreciate it if you could send me a recently retested Hfr. My stocks had deteriorated since before I sent them (with your permission) to M. Vogt.

The aeration effect on 58-161 is now clearly a phenocopy of F-. This is best shown by comparing crosses of aerated and unaerated 58-161 by W-1177 and its immediate F+ derivative W-1817. In all tests so far, the effect of aeration has not persisted, but iterated inocula in aerated cultures have not yet been tried. You should be able to confirm it easily by bubbling air through Penassay broth cultures, about 18-24 hours. The effect has also been noted in inocula from aerated synthetic medium (+BM). I have not observed the phenocopy in aerated TLB₁- cultures.

From my side, the question of transmission of F+ is very perplexing, and could use some imagination. May I continue to assume that you will be willing to have my collaboration in developing this problem?

Sincerely,

Joshua Lederberg

P.S. I am using to wrap the cultures a sample of the velvet such as we used for replica plating. It should interest you to know that it was imported from Italy. It costs here about \$ 4.50 per square yard, or about \$.10 per square. Since the pieces can be used repeatedly (as this one has), it is not so expensive as it seems: the velvet is far less expensive during its lifetime than a Petri dish.